

Monitoring Study Group Meeting Minutes

August 14, 2003

Arcata—U.S. Fish and Wildlife Service Office

The following people attended the MSG meeting: Tharon O'Dell (BOF-chair), Dr. Robert Ziemer (public), John Munn (CDF), Richard Gienger (HWC/SSRC), Jared Gerstein (UCCE), Duane Shintaku (CDF), Stein Werner (CGS), Mark Smelser (CGS), Stephen Levesque (Campbell Timberland Management), Clay Brandow (CDF), Randy Klein (RNSP), Bernie Bush (SRCO), Steve Horner (PALCO), Matthew House (SRCO), Peter Ribar (Campbell Timberland Management), Dr. Kate Sullivan (PALCO), Scott Carroll (RNP), Chris Heppe (RNP), Ted Oldenburg (Hoopa Tirbal Forestry), Holly Lundborg (NCRWQCB), Angela Wilson (CVRWQCB), Bill McDavitt (O'Connor Environmental), Sandra Brown (NRM), Dr. Bill Weaver (PWA), Dr. Cajun James (SPI), Eric Goldsmith (Sanctuary Forest, Inc.), and Pete Cafferata (CDF). **[Note: action items are shown in bold print].**

We began the meeting with general monitoring related announcements:

- John Munn stated that as part of the MOU signed by CDF, SWRCB, and the RWQCBs, the Monitoring Work Group has produced a draft MOU Monitoring Agreement for monitoring of timber harvesting activities. This document is a work in progress. The Monitoring Work Group meets each month to make refinements to the draft product. Dr. George Ice, NCASI, provided the group with a summary of monitoring efforts being conducted by the western states at the August meeting.
- Cajun James announced that the "Water Quality Monitoring in Forested Landscapes" workshop she is developing will be held on December 1st and 2nd (the dates for the workshop were changed after the MSG meeting) in Redding. Potential speakers include Drs. MacDonald, Benda, Ziemer, and possibly Dunne. Sponsors include the UC Berkeley Forestry Center and CDF. For further information, send Cajun an email at: cjames@spi-ind.com.
- Richard Gienger stated that the 6th Annual Coho Confab was held from August 22nd to 24th on the Mendocino Coast at the JugHandle Creek Farm. This workshop was cosponsored by the Salmonid Restoration Federation, Trees Foundation, and JugHandle Creek Farm. The Confab is held to explore watershed restoration and to enhance recovery of salmon and steelhead (for more information, see: <http://www.calsalmon.org/cohoconfab/index.html>).
- Richard Gienger also announced that an effort has begun to apply completed NCWAP information to the Interagency Watershed Assessment Team (IWAT) project (which grew out of the Stewardship Committee). This is a pilot study to determine if NCWAP data serves as a useful tool for cumulative watershed effects assessment as part of a THP or NTMP. Cathy Bleier of the Resources Agency is heading up the study and Jim Able is working with landowners that were part of the Buckeye Group for field sites. For further information on the project, contact Cathy at (916) 653-6598.

Following these announcements, Randy Klein, Redwood National and State Parks (RNSP) hydrologist and private consultant, provided a PowerPoint presentation titled “Sanctuary Forest, Inc. Erosion and Water Quality Monitoring at 2002 Stream Crossing Excavations.” The Sanctuary Forest, Inc. (SFI) has undertaken an erosion control and prevention program to reduce long-term sediment yield in the upper Mattole River watershed, with the focus on decommissioning of unneeded forest roads that pose sedimentation risks. SFI has conducted a monitoring project to determine volumes of erosion following road removal at excavated crossings, impacts to water quality, and the need for any modifications to the style or rate of road removal treatments (i.e., adaptive management). The monitoring program relied heavily on volunteers.

PWA inventoried 24 miles of roads to assess the erosional risk and treatment needs on SFI lands. The inventory identified 184 crossings to be excavated, and 65 were removed in 2002 (most of these were located on Class II watercourses). All 65 had photo points established and sketches drawn, 14 were selected for turbidity monitoring, and 18 had onsite erosion volumes determined. In addition to onsite monitoring, water quality monitoring was completed at 5 locations on larger streams in the general vicinity. Two of the 5 sites were located short distances downstream of the areas treated in 2002, while 3 sites drain areas in which no roadwork was undertaken (i.e., control areas). Additionally, surface erosion severity was estimated at the crossing sites. Removed crossings were treated with scattered slash to increase groundcover and reduce surface erosion, with the heaviest applications along lower slopes. The crossings were not grass seeded or straw mulched due to concerns about introducing non-native seed sources.

The large storms during the winter of 2002/2003 provided a good test of the practices implemented at the removed stream crossings—particularly in December of 2002. Grab samples for turbidity were obtained by volunteers for many of the early and mid-December runoff events. Turbidity levels were determined by the volunteers and checked by Randy. In general, data collection was good, but a few paired samples appear to have been swapped (i.e., mislabeled), since NTU values were higher above the crossing when compared to the sample below the crossing. Eight stations were sampled during the first storm, November 8-9, 2002, and 5 of these had much higher turbidity values downstream compared to upstream. Fourteen crossings were sampled during the next storm, December 14th, and the erosion response had decreased considerably, even though the storm was larger—probably due to flushing from the first storm. By the March 14th storm, nearly all the crossings sampled had fairly similar turbidity values above and below the crossing location. For the offsite turbidity sites, Randy found a higher turbidity response in the treated basins when compared to the untreated basins. The assumption is that the excavated crossings resulted in the elevated downstream turbidity, but this cannot be concluded with assurance because the basins had not been calibrated prior to treatment.

Erosional void dimensions were measured at 18 excavated crossings. Both channel scour and bank slumps were documented for each crossing. Survey work was not conducted prior to the onset of winter rains, so channel scour was estimated by making field measurements of scarp heights and top widths at geometric transition points within the excavation. A method based on more detailed cross section measurement in RNP was developed to estimate the true volume of erosion at each transition. It was found

that excavated side slope steepness provided a reasonably accurate means to reduce gross area (i.e., the steeper the side slopes, the less true erosion area is a percentage of gross area). Randy re-measured all the erosion void sites completed earlier by the volunteers.

Channel scour was found to be ubiquitous, and some amount of scour appears inevitable. Most of the erosion was found in the excavated channel areas, but some was also documented above crossings where the pipes were located. Nearly all the documented erosion was considered delivered sediment, due to proximity of disturbance to the channel. The total sediment delivery for the first winter was 279 yds³, with an average of 15.5 yds³ per crossing. Sediment yield for individual crossings ranged from over 50 yds³ to less than 5 yds³. In general, channel scour strongly dominated sediment yield. Bank slumps were relatively minor except at one removed crossing. Randy characterized erosion void measurement as superior to turbidity grab samples for documenting water quality impacts, since grab sample turbidity monitoring is only a “spotty snapshot” portrayal of water quality. Continuous recording turbidimeters would provide a much more definitive picture of the true water quality impact at a given crossing.

Next Randy described the turbidity monitoring sites that are being used in Lost Man Creek in Redwood National Park, located near Orick. Large parts of the Lost Man Creek watershed were heavily disturbed by tractor logging in the 1950's and 1960's. Parts of the basin are composed of highly erodible soft sedimentary rock (Gold Bluff Formation) and parts are underlain by harder sedimentary rocks. Most of the road removal work was completed in Larry Damm Creek in 2002, a tributary of Lost Man Creek, with 12 crossings excavated. In 2001, substantial road removal was also done in North Fork Lost Man Creek. Continuous stage and turbidity data are available for lower Lost Man Creek near the old fish hatchery, the South Fork Lost Man Creek tributary, and Little Lost Man Creek, a “dirty” pristine reference stream (due to recent landslide activity).

Lower Lost Man Creek had turbidity readings of over 1800 NTUs twice in December 2002, with lower values in January through March 2003. South Fork Lost Man Creek and Little Lost Man Creek had turbidity values of approximately 800 NTUs in the December 2002 storms. This data was collected by Graham Matthews and Associates, under contract to RNSP. Manual turbidity sampling above and below excavated crossings showed large differences in turbidity for several of the crossings on December 14, 2002, with less difference in turbidity for the December 16th and March 27th storms. Peak stormflow turbidities for the 9 largest storms of water year 2003 for the recording turbidity sites showed that early in the winter, lower Lost Man Creek had turbidity values about 3 times higher than South Fork Lost Man Creek. During mid to late December, the ratio went up to 7-9 times higher, and then tapered off to about 2 times higher. The conclusion was that the 12 removed crossings flushed surface erosion material during early storms, then significant scour and slumping occurred in mid to late December. RNSP has placed large wood in the excavated crossings to stabilize sediment transport, dissipate energy, control grade and reduce channel incision; they have found this treatment to be effective and prefer this technique to importing offsite rock to stabilize the channel, since wood is thought to be biologically superior.

Following Randy's formal presentation, a long and fruitful discussion of his results took place. Bob Ziemer stated that it is not surprising that substantial erosion from crossing abandonment was documented and that the short-term impacts of this type of treatment must be clearly understood. Holly Lundborg stressed that it is critical to complete the adaptive management feedback loop and apply techniques that can lessen adverse impacts for future projects. She also added that the rate of crossing removal and road abandonment must be appropriate. Randy added that the PWA road inventory showed a potential for losing approximately 19,000 yds³ from the 65 crossings excavated in 2002 and that 300 yds³/19,000 yds³ is only 1.6%. If no work had been completed during the winter of 2002/2003, it is not unreasonable to think that one or two of the treated crossings might have failed, inputting more than 300 yds³.

Randy also stated that he would not encourage onsite turbidity grab samples above and below crossings—since the data are needed more frequently and at peak flow periods. Both the RNP and Upper Mattole River studies supported this conclusion. Abandoned crossings at low gradient channel reaches with channel aggradation were found to be risky locations (0.5% to 3% channel gradient) due to the potential loss of sediment stored above these crossings. Large wood placement can be especially beneficial in these situations. Randy stressed that the 15.5 yds³ of sediment lost per crossing was only from the first winter and that the value would rise over time. Bill Weaver added that even though the Upper Mattole River work showed most the erosion was due to channel scour, other work mainly completed in RNP has shown that bank slumping and channel scour totals are usually nearly equal—especially for larger crossings. Dr. Weaver stated that Dr. Mary Ann Madej, USGS, has reported a 4 to 5% long-term sediment yield compared to total sediment removed from large RNP crossings, with a corresponding average yield of 65 yds³ per crossing (over 20 years). He also said that Mary Ann has found 75% to 80% of the sediment yield to occur the first year following crossing removal. Randy added that one has to determine what volunteers can complete in a satisfactory manner—and what they are not able to complete. In this case, volunteers were able to collect grab water samples but were not able to make cavity void measurements successfully. **Randy's revised final report to SFI will be posted on the MSG's website under Archived Documents when it is available.**

Following lunch, Holly Lundborg provided some comments to the MSG regarding the MSG's Hillslope Monitoring Program (HMP). The NCRWQCB is concerned that the HMP results reported to the BOF in January 2003 are being misconstrued in the public arena. She stated that while the results are adequately explained in the document, they are often misused in public testimony. **The Water Board would like to see a true cooperative monitoring effort grow out of the MOU Monitoring effort currently underway (CDF, SWRCB, RWQCBs, other resource agencies).** This applies to the Dunne Report pilot project, HMP, and Modified Completion Report (MCR) Monitoring. For MCR work in particular, a "208" approach was suggested, where interdisciplinary teams would evaluate practices on a random subset of plans. Holly also mentioned that the Interdisciplinary Scientific Review Panel Phase II Report is now available online at: http://www.swrcb.ca.gov/rwqcb1/agenda/08_2003/items/concur/Final-Phase-II-ISRP-Report.pdf.

Clay Brandow provided the MSG with updated results from the Modified Completion Report monitoring program, using data collected by CDF Forest Practice Inspectors. A

random sample of 12.5% of all completed THPs undergoing Work Completion Report field inspections is currently being collected on randomly located road transects, Class I and II WLPZ transects, and watercourse crossings. To date 210 THPs have been sampled, 160 with WLPZs. Class I and Class II WLPZ total canopy, measured with a sighting tube, averages 83% overall for the Coast Forest Practice District and 70% for the interior Forest Practice Districts. These values are about the same as reported by Clay last September and are also very similar to those reported in the HMP report presented to the BOF in January 2003. For roads, 182 1000-foot transects have been sampled, which equates to about 34.5 miles. At least one departure from the Forest Practice Rules (FPRs) has been found on 16% of the road segments. In total, 56 departures from the Rules have been found, with most relating to waterbreak spacing (47%), waterbreak construction (15%), waterbreak discharge into cover (13%), and drainage ditch maintenance (10%). Out of the 56 road-related departures, 36 had effectiveness inspections completed. About 30% of these 36 departures resulted in sediment transport to a watercourse. To date, 269 watercourse crossings have been sampled, including 184 culverts, 82 fords/dips, and 3 bridges. FPR departure and marginally acceptable rates are low. The Rule with the poorest implementation relates to crossings being built without diversion potential. About 14% of the sampled existing crossings have had departures or marginally acceptable ratings for this rule. Newly constructed crossings had lower departure rates than that found for existing crossings. In general, the crossing FPR implementation rates have been better than those reported in the 2002 HMP report.

Clay is concerned about getting a complete random sample of 12.5% of all completed THPs because the completion of MCRs has fallen significantly during the summer of 2003. **A memorandum was sent to CDF Region and Division Chiefs from new Assistant Deputy Director Duane Shintaku urging completion of MCRs. Additionally, Clay will stress the importance of this work at the next CDF Forest Management Committee (FMC) meeting.**

After the MCR update, there was a discussion concerning requiring the CDF Forest Practice Inspector go over the completed MCR with the LTO and/or RPF. Currently the Forest Practice Inspector can provide a copy of the MCR to the LTO, RPF or landowner on request. Due to the need to keep monitoring separate from inspection/enforcement, Assistant Deputy Director Duane Shintaku decided we would not require the Forest Practice Inspector to review a completed MCR with the LTO or RPF. MCR monitoring is designed to collect information on the implementation and effectiveness of the Forest Practice Rules in protecting water quality. MCR monitoring protects landowner confidentiality, is separate from the normal inspection process, and is not intended to be used for enforcement purposes.

Stephen Levesque updated the MSG on the South Fork Wages Creek cooperative monitoring project. The draft study plan for the project was placed on the MSG website on July 23rd (see [http://www.bof.fire.ca.gov/pdfs/spl_fav\(1\).pdf](http://www.bof.fire.ca.gov/pdfs/spl_fav(1).pdf)). **Peer review has been requested from Dr. Bob Ziemer (public), Dr. Kate Sullivan (PALCO), Dr. George Ice (NCASI), Jack Lewis (USFS-PSW), and Randy Klein (RNSP). Additionally, all MSG participants are invited to provide peer review and comments to Stephen by September 15, 2003.** Monitoring equipment purchased by CDF for the project is currently being bench tested and will be installed at the field site in September. A field

review of the site took place on July 28th with representatives from CDF, Campbell Timberland Management (CTM), Graham Matthews and Associates, and the NCRWQCB. A brief PowerPoint presentation with pictures from the field visit was shown to illustrate the general setting and the study design. A draft MOU between CDF, CTM, and possibly the NCRWQCB was sent to Stephen on July 11th to document goals, contributions of each participant, and timelines for project implementation. It is anticipated that 4 storms per year will be sampled, with people stationed in the field to complete the sampling and ensure adequate instrument performance.

Cajun James stated that she does not believe it is necessary or cost effective to station people in the field during storm events because, in her experience, equipment failures with recording turbidimeters have been exceedingly rare. Bob Ziemer stated that at Caspar Creek, we have had people present in the field during storms to keep the equipment functioning properly. After storms, if the turbidity trace indicates a significant spike has occurred, field teams are sent up stream channels to document the source of the turbidity. **Bob stressed that he believes that the project has a fairly good chance of success, but is weak in defining the questions that we are trying to answer. Improvement in the study plan is required here.** Clearly, this is not being approached as a research grade project, but we must be able to define what we are trying to accomplish with this monitoring effort. Is it to determine the dominant sediment sources and their relative contributions, or to document chronic turbidity levels on the falling limb of the hydrograph? How much pre-treatment data is needed depends on the question(s) being asked. It is critical that the data addressing the question(s) being asked determines when adequate pretreatment data has been obtained.

Cajun James spoke briefly about the SPI cooperative monitoring project. Rather than use the paired watershed approach described by Stephen for the South Fork Wages Creek project, Cajun is proposing an above/below study design. She does not believe that we can adequately determine background sediment yield in a few years, and she could not find a truly comparable watershed for a control basin. She currently has implemented the above/below study design in Upper San Antonio Creek, Judd Creek (Southern Exposure), Bailey Creek (tributary of Cow Creek), and Millseat Creek. She believes that her cooperative study site will be located in the Coffee Creek drainage in Trinity County, but a field investigation of the site is still needed. Recording turbidimeters will be installed above the treatment area in relatively undisturbed USFS lands, as well as downstream documenting the impacts of a given THP. **Cajun will write a study plan describing the proposed cooperative project by mid-September.**

During the public comment period, Richard Gienger suggested that it may be beneficial to have the RPF who wrote a THP conduct the MCR inspection. This would allow the people writing the plans to learn what happens following timber harvesting activities, which would complete the feedback loop and allow more effective practices to be used in the future. Stephen Levesque stated that RPFs currently do not have sufficient time available to conduct this type of monitoring.

It was decided that the next MSG meeting will be held on October 16th, 10:00 a.m., at Howard Forest.